Claims

1. A digital television application protocol for providing communication between applications running on a client device and a service provider comprising:

a meta language comprising an application level communication protocol for communication of messages for requests and information between client applications and service providers;

a communication link between a client device and a service provider for sending and receiving requests and information between the service provider and the client;

a DATP protocol process residing in the client device for sending a DATP message encapsulating a meta language message to a service provider; and

a conversion function for converting the client's DAP request into a DATP message for transmission to the service provider over the communication link.

2. The protocol of claim 1 wherein the DATP process interfaces with the native language of the client device and is positioned within the OSI data link layer in the client device.

3. The protocol of claim 1 further comprising a service gateway for converting DATP messages into a plurality of standard protocols for transmission to a service provider.

4. The protocol of claim 3 further comprising a transcoder for converting content received from a service provider into a format suitable for display on the client device.

5. The protocol of claim 3 wherein the DATP at the client receives compressed data and decompresses the compressed data; and
the service gateway performs compression of client data sent back to the service provider from the client.

6. The protocol of claim 1 wherein the DATP at the client receives encrypted data and decodes the encrypted data using RSA , wherein the exponent m is greater than or equal to 3.

7. The protocol of claim 3 wherein the SGW performs asymmetrical data routing of data sent to the client and sent back to the service provider from the client based on the size of the data and availability of the broadcast stream and the point-to-point connections between the SGW and the clients.

8. The protocol of claim 3 further comprising:
a LHTTP language for encapsulating HTTP requests within DATP messages and sending the LHTTP requests to the service gateway for translation into a standard protocol.

9. The protocol of claim 1 further comprising:

a data name service for resolving a service identifier for an application server.

10. The protocol of claim 1 wherein the message is divided into individually encrypted message fragments.

11. The protocol of claim 1 further comprising a DATP reliability layer.

12. The protocol of claim 11 further comprising unreliable DATP messages.

13. The protocol of claim 1 wherein the DATP protocol spans the data link, network, transport and session OSI layers.

14. The protocol of claim 1 wherein a sending enity determines that memory is available at a receiving entity before sending a DATP message.

15. The protocol of claim 1 wherein a business filter associated with a client is set to select the most relevant information for the client based on at least one of the following: client preferences, viewer profiles or transaction history.

16. The protocol of claim 1 further comprising an offline viewer identification function which enables offline viewer payment.

17. The protocol of claim 1 further comprising an offline order form.

18. The protocol of claim 1 wherein a store and forward library is provided on top of DATP comprising messages having different timing constraints for delivery comprising "as soon as possible", "when connected", "after a random period of time", "after a set period of time", "after a specified occurrence, event or message" and "spread over available time/bandwidth."

19. The protocol of claim 1 wherein DATP sits in typical OSI network model at the transport level.

20. The protocol of claim 1 wherein DATP sits in the typical OSI model at the service level.

21. The protocol of claim 1 wherein a message is sent from a client to the SGW, wherein each DATP message comprises a plurality of DATP message fragments, wherein each fragment contains a sequence number; and
a sliding time window of recently used sequence numbers with a time stamp for each sequence number wherein fragments with sequence numbers that appear in the sliding window are disgarded.

22. A digital television application protocol for providing communication between applications running on a server, a client device and a service provider comprising:

a server hosting service providers;

a meta language comprising an application level communication protocol for communication of messages for requests and information between client applications and service providers;

a communication link between a client device and a service provider for sending and receiving information between the service provider and the client;

a DATP protocol client process residing in the client device for sending a DATP message encapsulating a meta language message to a service provider;

a conversion function for converting the client's DAP request into a DATP message for transmission to the service provider over the communication link, wherein the DATP client process interfaces with the native language of the client device and is positioned within the OSI data link layer in the client device;

a service gateway for converting DATP messages into a plurality of standard protocols for transmission to a service provider; and a transcoder for converting content received from a service provider into a format suitable for display on the client device.

23. The protocol of claim 23 wherein the client receives compressed data and decompresses the compressed data, the service gateway performs compression of

client data sent back to the service provider via the service gateway from the client, the client receives encrypted data and decodes the encrypted data using RSA, wherein the exponent m is greater than or equal to 3 an wherein the encrypted data is divided into individually encrypted DATP message fragments for individual decryption.

24. The protocol of claim 23 wherein the SGW performs asymmetrical data routing of data sent back to the service provider from the client based on the size of the data and availability of the broadcast stream and the point-to-point connections between the SGW and the clients, further comprising, LHTTP for encapsulating HTTP requests within DATP messages and sending the LHTTP request to the service gateway for translation into a standard protocol.

25. The protocol of claim 22 further comprising:
a data name service for resolving a service identifier for an application server;
a DATP reliability layer, further comprising unreliable messages wherein the DATP protocol spans the data link, network, transport and session OSI layers.

26. The protocol of claim 25 wherein a sending enity determines that memory is available at a receiving entity before sending a DATP message; and

a business filter associated with a client select the most relevant information for the client based on at least one of the following: client preferences, viewer profiles or transaction hitory.

27. The protocol of claim 26 further comprising an offline viewer identification function which enables offline viewer payment and an offline order form.

28. The protocol of claim 23 wherein a store and forward library is provided on top of DATP comprising messages having different timing constraints such as, "as soon as possible", "when connected", "after a random period of time", "after a set period of time", "after a specified occurrence, event or message" and "spread over available time/bandwidth."

29. The protocol of claim 22 wherein a message is sent from a client to the SGW, wherein each DATP message comprises a plurality of DATP message fragments, wherein each fragment contains a sequence number;
a sliding time window of recently used sequence numbers with a time stamp for each sequence number wherein fragments with sequence numbers that appear in the sliding window are disgarded.

30. A digital television application protocol for providing communication between applications running on a client device and a service provider comprising:

a meta language comprising an application level communication protocol for communication of messages for requests and information between the client and the service provider;

a server providing communication to a service provider;

a communication link between a client device and a service provider for sending and receiving messages and information between the service provider and the client;

a DATP protocol client process residing in the client device for sending a DATP message encapsulating a meta language message to a service provider, wherein the DATP client process interfaces with the native language of the client device and is positioned within the OSI data link layer in the client device, wherein the DATP at the client receives compressed data and decompresses the compressed data, wherein the DATP at the client receives encrypted data and decodes the encrypted data using RSA , wherein the exponent m is greater than or equal to 3;

a conversion function for converting the client's DAP request into a DATP message for transmission to the service provider over the communication link;

a service gateway for converting DATP messages into a plurality of standard protocols for transmission to a service provider;

a transcoder for converting content received from a service provider into a format suitable for display on the client device;

the service gateway performs compression of client data sent back to the service provider from the client;

wherein a DATP message is sent from a client to the service gateway, wherein each message comprises a plurality of DATP message fragments, wherein each fragment contains a sequence number; and

a sliding time window of recently used sequence numbers with a time stamp for each sequence number wherein fragments with sequence numbers that appear in the sliding window are disgarded.

31. The protocol of claim 30 wherein the SGW performs asymmetrical data routing of data sent between the service provider and the client based on the size of the data and availability of the broadcast stream and the point-to-point connections between the SGW and the clients, further comprising:

a LHTTP language for encapsulating HTTP requests within DATP messages and sending the LHTTP request to the service gateway for translation into a standard protocol;

a data name service for resolving a service identifier for an application server.

a DATP reliability layer;

wherein the DATP protocol spans the data link, network, transport and session OSI layers, wherein a sending enity determines that memory is available at a receiving entity before sending a DATP message; and

wherein a business filter associated with a client selects the most relevant information for the client based on at least one of the following: client preferences, viewer profiles or transaction history.

32. The protocol of claim 31 further comprising:

an offline viewer identification function which enables offline viewer payment;

an offline order form; and

a store and forward library provided on top of DATP comprising messages having different timing constraints such as, "as soon as possible", "when connected", "after a random period of time", "after a set period of time", "after a specified occurrence, event or message" and "spread over available time/bandwidth."

33. A method for providing a digital television application protocol for providing communication between applications running on a client device and a service provider comprising:

providing a server for communication with a service provider;

providing a meta language comprising an application level communication protocol for communication of messages for requests and information between client applications and service providers;

providing a communication link between a client device and a service provider for sending and receiving requests and information between the service provider and the client;

providing a DATP protocol process residing in the client device for sending a DATP message encapsulating a meta language message to a service provider; and

providing a conversion function for converting the client's DAP request into a DATP message for transmission to the service provider over the communication link.

34. The method of claim 33 wherein the DATP process interfaces with the native language of the client device and is positioned within the OSI data link layer in the client device.

35. The method of claim 33 further comprising:
providing a service gateway for converting DATP messages into a plurality of standard protocols for transmission to a service provider.

36. The method of claim 35 further comprising:
providing a transcoder for converting content received from a service provider into a format suitable for display on the client device.

37. The method of claim 35 wherein the DATP at the client receives compressed data and decompresses the compressed data; and
the service gateway performs compression of client data sent back to the service provider from the client.

38. The method of claim 33 wherein the DATP at the client receives encrypted data and decodes the encrypted data using RSA , wherein the exponent m is greater than or equal to 3.

39. The method of claim 35 wherein the SGW performs asymmetrical data routing of data sent to the client and sent back to the service provider from the client based on the size of the data and availability of the broadcast stream and the point-to-point connections between the SGW and the clients.

40. The protocol of claim 35 further comprising:
providing a LHTTP language for encapsulating HTTP requests within DATP messages and sending the LHTTP requests to the service gateway for translation into a standard protocol.

41. The method of claim 33 further comprising:
providing a data name service for resolving a service identifier for an application server.

42. The method of claim 33 wherein the DATP message is divided into individually encrypted DATP message fragments.

43. The method of claim 33 further comprising:

providing a DATP reliability layer.

44. The method of claim 43 further comprising:

providing unreliable DATP messages.

45. The method of claim 43 wherein the DATP protocol spans the data link, network, transport and session OSI layers.

46. The method of claim 33 wherein a sending enity determines that memory is available at a receiving entity before sending a DATP message.

47. The methodof claim 33 further comprising:

providing a business filter associated with a client is set to select the most relevant information for the client based on at least one of the following: client preferences, viewer profiles or transaction history.

48. The method of claim 33 further comprising:

providing an offline viewer identification function which enables offline viewer payment.

49. The method of claim 33 further comprising:

providing an offline order form.

50. The method of claim 33 further comprising:

providing a store and forward library on top of DATP comprising messages having different timing constraints for delivery comprising "as soon as possible", "when connected", "after a random period of time", "after a set period of time", "after a specified occurrence, event or message" and "spread over available time/bandwidth."

51. The method of claim 33 wherein DATP sits in typical OSI network model at the transport level.

52. The method of claim 33 wherein DATP sits in the typical OSI model at the service level.

53. The method of claim 33 wherein a message is sent from a client to the SGW, wherein each DATP message comprises a plurality of DATP message fragments, wherein each fragment contains a sequence number;

a sliding time window of recently used sequence numbers with a time stamp for each sequence number wherein fragments with sequence numbers that appear in the sliding window are disgarded.